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I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004901752 for a patent by INNOVONICS LIMITED as filed on 01 April 2004.

WITNESS my hand this  
Twelfth day of April 2005

A handwritten signature in black ink, appearing to read "J. K. Peisker".

JANENE PEISKER  
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SUPPORT AND SALES



## HIGH RESOLUTION DIGITAL CAMERA

This Invention relates to a high resolution video camera. Many digital video cameras such as those used in CCTV security applications capture video information using a CCD or similar image sensor array and then output the video images in an analogue PAL or NTSC composite video format. This composite video format is an industry standard and a wide range of equipment including displays and digital video recorders are available for use with composite video.

Composite video can be provided in PAL or NTSC format. In this description reference to composite video includes either NTSC or PAL format. Composite video can also be black and white or full colour.

Video cameras that output a composite video signal do so using an analogue signal made up of sequential odd and even fields. Each field is essentially only half of the horizontal scanning lines required to make up a complete PAL or NTSC picture. The odd and even fields are then "interlaced" by the recording or display device to build a full PAL or NTSC image. Where motion video using interlacing is displayed, visual perception and persistence in the display provide a smooth visual rendering of the image at good resolution. However where it is required to display the video image as a still image or to record the image using a video recorder and to later print or display a fixed image then the effect of interlacing provides severe limitations. As each image field is captured approximately 20 mili-seconds apart, (50Hz for PAL; 60Hz for NTSC) combining the fields will cause smudging or fuzziness on any moving part of the image. De-interlacing filtering such as in software can be used but this is only partially effective and effectively reduces the available resolution. For this many reason many digital video recording systems only record single odd or even fields. This approach is called 2CIF resolution recording and avoids interlacing effects but at the cost of reduced resolution.

This invention relates to a camera in which a full NTSC or PAL resolution image or better is captured within the camera as a single image, within a very short time typically less than 1 millisecond. The image is then stored in a short term video image memory buffer. From this memory buffer the image can then be manipulated to provide two interlaced odd and even fields that are then provided as a standard composite video electrical output.

The advantage of this approach is that the composite video output from the camera is still compatible with existing composite video displays and recorders and will display and replay normally. However if where odd and even field pair are combined by interlacing and then displayed or printed as a still image, the image will be at full NTSC or PAL resolution but completely free of interlacing effects. This approach provides significantly improved high resolution still images of moving objects such as for use in evidence, identification and documentation.

In a second embodiment this principle can be extended to provide very high resolution images. In this case a large, high resolution original image is transmitted as 4 or 8 fields.

In the example of an image being transmitted in 4 fields, The first, fifth, ninth etc (1+4n) scan lines in the original image are used to make the lines provided in the first odd field transmitted from the camera,

Then the third, seventh,  $(3 + 4n)$  scan lines in the original image are used to make up the following even field transmitted from the camera.

In a similar way the  $(2 + 4n)$  scan lines from the original image are used to make up the second odd video field transmitted from the camera and each 4<sup>th</sup> scan line from the original image is used to make up the following second even video field transmitted from the camera.

This invention has the distinct advantage that the each field or odd and even field pair forms a complete image at reduced resolution and can be displayed or recorded using standard composite video equipment and techniques while still providing the opportunity to interlace 4 fields to form a very high resolution image, particularly suited to still image reproduction.